Assignment I: Matter

A. DISCOVERING CONCEPTS

Circle the letter in front of the best answer to complete each statement.

1. _____ is an example of a homogeneous material:
   a. Wood b. Granite c. Concrete d. Salt

2. Ice and _____ are different phases of the same homogeneous substance.
   a. mercury b. steam c. alcohol d. dry ice

3. If a sample of material contains three phases, the sample is _____.
   a. homogeneous b. heterogenous

4. Substances may be either _____ or compounds.
   a. mixtures b. elements c. solutions d. heterogenous materials

5. A solution a (n) _____.
   a. compound b. element c. substance d. mixture

6. _____ is a compound.
   a. Nitrogen b. Oxygen c. Air d. Carbon dioxide

7. _____ is NOT a substance.
   a. Sulfur b. Air c. Sugar d. Carbon dioxide

8. Salt is dissolved in some water. The water is the _____.
   a. solution b. interface c. solvent d. solute

9. Ductility and malleability are _____ properties.
   a. intensive b. chemical c. extensive d. electrical

10. Distillation is used to separate liquids with different _____.
    a. freezing points b. solubilities c. densities d. boiling points

11. When chemical change takes place, a new _____ is always formed.
    a. substance b. element c. mixture d. solution

12. Compounds can usually be broken down into their constituent elements by _____.
    a. physical change b. distillation c. chemical change d. fractional crystallization

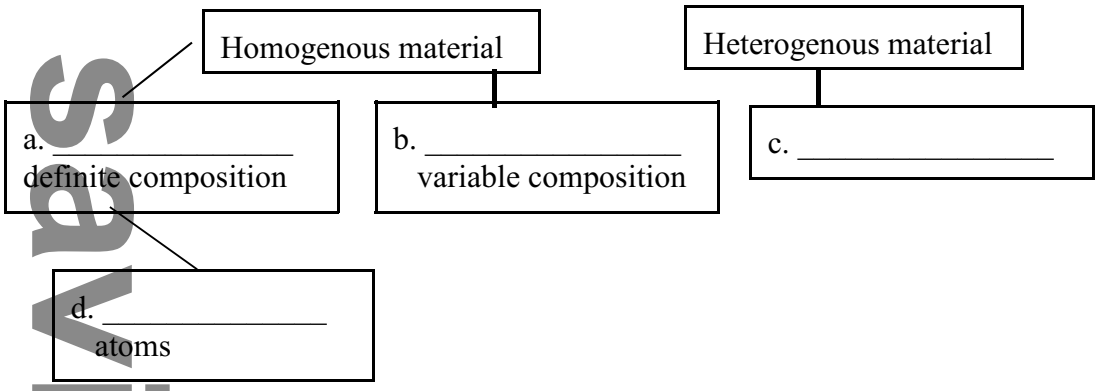
B. INTERPRETING CONCEPTS

1. Match the following materials with the correct descriptions.

a. iron fillings	_____	(1) element
b. salt	_____	(2) mixture
c. sand and powdered zinc	_____	(3) solution
d. sugar and water	_____	(4) compound

2. Classify the following as heterogeneous mixtures, solutions, compounds, or elements.
a. nitrogen _____
b. grain alcohol _____
c. gasoline _____
d. milk _____
e. sodium hydrogen carbonate _____

3. Label the spaces using the appropriate term: solutions, mixtures, elements, and compounds.



4. Water$_{(l)}$, is one phase of the compound H_2O. Name two other phases of this same substance.
a. _____ b _____

5. Name and describe a homogenous mixture. _____
_____

6. Name four substances. a. _____ b. _____
c. _____ d. _____

C. USING CONCEPTS

1. Differentiate between a homogenous material and a heterogenous material.
_____
_____
_____

2. Differentiate between an element and a compound.
_____
_____
_____

3. Explain why liquids in a solution may be separated by fractional distillation. _____
_____
_____
_____

4. Explain how a chemical change differs from a physical change. _____
_____
_____

5. a. Explain how to separate a mixture of iron filings and zinc filings.
_____

b. Explain how the sugar could be separated from a sugar-water solution.

D. COMPLETING CONCEPTS

Fill in the blanks correctly. Use each of the listed words once.

chemical change	homogeneous	precipitate
chemical property	malleability	solution
compound	phase	solvent
ductility	physical change	substance
element	physical property	solubility

1. _____ describes the ability of a metal to be hammered into sheets.

2. A (n) _____ is any region with a uniform set of properties.

3. A (n) _____ is a homogenous material with a variable composition.

4. A (n) _____ is either a compound or element.

5. A (n) _____ has occurred if a new substance has been formed.

6. A (n) _____ is an insoluble substance which forms in a solution.

7. A (n) _____ is a surface where different phases are in contact.

8. The dissolving material in a solution is called the _____.

9. _____ is the ability of a metal to be drawn into a fine wire.

10. _____ materials consist of only one phase.

11. A (n) _____ is a substance composed of more than one kind of atom.

12. When only the appearance of a material has been altered, a (n) _____ _____ has taken place.

13. A (n) _____ is a substance composed of only one kind of atom.

E: Making Connections

1. Heating the white crystalline solid called potassium chlorate will give a white granular powder potassium chloride and a colourless gas capable of maintaining combustion.

a. Is potassium chlorate an element or a compound? Justify your response.

b. What colourless gas is formed during this reaction?

c. Is this gas an element or a compound? Explain.

d. Has a physical or a chemical change occurred. State your answer with reasons.

2. Anna places a white solid to a clear colourless solution, she observes a vigorous reaction, producing a colourless gas. This gas is tested with limewater, the solution turns cloudy.

a. Is the white solid an element or a compound? Explain.

b. What is the name and the chemical formula of the gas?

c. Has a physical or chemical change occurred? Explain